SOCIETIES AND ACADEMIES

LONDON

Royal Society, November 27.—"A Memoir on the Single and Double Theta-Functions," by A. Cayley, F.R.S., Sadlerian Professor of Pure Mathematics in the University of Cambridge.

Chemical Society, November 20.—Dr. Gilbert in the chair.—The Chairman announced that a ballot for the election of Fellows would take place at the next meeting, December 4.—The following papers were read:—A chemical study of vegetable albinism, Part II. Respiration and transpiration of albino foliage, by Mr. Church. White foliage does not possess the power even in sunshine of decomposing the carbonic acid in the air. Experiments were made with leaves of the maple, holly, ivy, and Alocasia; 1,000 sq. ctm. of the leaves of the Alocasia evolved in two hours, 15·06 and 38·96 parts of carbonic acid per 10,000; 1,000 sq. ctm. of green leaves 1 14 parts. White holly sprays placed in water, gained in two hours five times as much in weight as green leaves, but when no water was supplied, the green lost about twenty times as much as the white.—Contributions to the history of putrefaction, Part I., by Mr. C. T. Kingzett. The author has examined dilute solutions of albumen, beef, and fish as to their oxygen-absorbing power in different stages of putrefaction, by titrating with permanganate. He finds that such substances require less oxygen as the putrefactive process proceeds; he also discusses the bearing of his results on the permanganate method of estimating the organic matter in potable waters.—Notes on manganese dioxide, by C. R. A. Wright and A. E. Menke. The authors have made an exhaustive study of the various methods for preparing manganese dioxide; in most cases the product contains potash and is deficient in oxygen; the methods which yielded the purest manganese dioxide were, heating manganese nitrate to 160° C., mixing a hot solution of a manganese salt with an excess of permanganate, or in the cold with the addition of zinc sulphate or ferric chloride. The volumetric processes of Kessler and Pattinson gave good results; the authors suggest some convenient modifications of these methods; they have verified the statements of Gorgeu, Guyard, and Pickering, but have disproved those of Morawski and Stingl.—On the reaction between sodium thiosulphate and iodine; estimation of manganese oxides and potassium dichromate, by S. Pickering. The author has carefully worked out the influence of dilution, excess of potassium iodide, heat, and other conditions, on the results obtained by Bunsen's volumetric method of estimating manganese oxide. He suggests a simplified method of procedure and compares results obtained by the two processes.

Linnean Society, November 28.—Prof. Allman, president, in the chair.—Messrs. Winslow, Jones, and Wm. Wickham were elected Fellows.—Sir J. D. Hooker exhibited a specimen and read a paper on the discovery of a variety of the cedar of Lebanon on the mountains of Cyprus (see *Science Notes*).—The president also laid on the table examples of a cone-bearing *Cedrus deodora*, grown by Mrs. C. St. Clair at Parkstone, Dorset.—Mr. E. M. Holmes exhibited and made remarks on a series of rare British lichens, Hepaticæ, and freshwater algæ. He noted that the so-called *Echinella articulata* which now chokes the filter beds of the reservoir at Bradgate, Leicester, was in reality an undescribed form, but bearing resemblances to Zooglœa. Mr. Holmes likewise exhibited, and for the first time in England, the leaves, flowers and portion of the trunk of the tree (*Audira araroba*) yielding the so-called Goa powder. This vegetable secretion appears to destroy and replace the woody tissue of the heart-wood. The source of the powder was long enveloped in mystery, but from its containing chrysophanic acid it was believed to be the product of a fungus. Recently it has been found that the cane grows in Bahia, is sent to Lisbon, thence exported to the Portuguese colonies in the East where it is used as a specific for ringworm.—Mr. T. Christy showed two aboriginal Australian skulls with occipital thickening (forwarded by Dr. Bancroft), and supposed to have been induced by the blows of knobkerries.—Mr. Marshall Ward read a contribution to our knowledge of the embryo sac of phanerograms. In this paper, stages in the development of the ovule in *Butomus umbellatus*, *Alisma plantago*, *Anemone japonica* and other forms have been carefully observed and delineated from microscopic section. The views of Strasburger, Vesque and Warming are severally compared and reviewed, the author holding intermediate opinions. Mr. Ward advances the following:—The ovule so far as its nucleus is concerned arises as a group of cells which divide and become arranged in groups of sister cells symmetrically related to the shape of the whole organ. One cell group leads in growth and fulfilling a special purpose, becomes the embryo sac. Further feeble division of this latter produces a watery cell with two nuclei. Each nucleus again produces four nuclei by bipartite division followed by grouping, and a nucleus from the top group moves towards the middle sap cavity. Each group of four cells is a prothallus, and the cell producing this a macrospore. The two most successful macrospores behave similarly to those of some vascular cryptograms, and finally germinate, producing a ruddy prothallus of four naked nuclei. The egg-cell is an oösphere, all that is left of the lower part of the rudimentary archegonium, its upper part probably being represented by the two "synergidæ" which are to be looked upon as having acquired a secondary function from being merely protective and guiding neck-cells of an archegonium.—Mr. Alfred Haddon read a paper on the extinct land tortoises of Mauritius and Rodriguez. Examination of a large store of material obtained by Mr. Edward Newton, corroborates the two Mauritian species *Testudo triserrata* and *T. inepta* described by Dr. Günther; but it adds no fresh example to that apparently unsatisfactory species *T. leptocnemis*. Of remains from the Island of Rodriguez the species *T. Vosmœri* can alone be distinguished. The free coracoid of *T. inepta* is now for the first time recorded, while that of *T. Vosmœri* is wonderfully irregular in character. Great variation in the ankylosis of the coracoid with the shoulder girdle pertains in this extensive series in the Cambridge Museum.—The secretary read in abstract a communication by Mr. Edward J. Miers, viz.: On a small collection of crustacea made by Mr. Edward Whymper, chiefly in the N. Greenland Seas, with an appendix on additional species collected by the late British Arctic Expedition.

Entomological Society, November 5.—H. W. Bates, F.L.S., F.Z.S., vice-president, in the chair.—Mr. T. R. Billups, of Peckham, was elected an Ordinary Member of the Society.—Mr. W. C. Boyd exhibited a remarkable variety of *Aspilates citraria*, a specimen of *Cidaria testata* in which the hind wings were apparently absent, and a Noctua resembling *Hadena dentina*, but differing from that species in the form of the body. Mr. McLachlan read some remarks he had received from Prof. Forel relative to the sculptured stones on the shores of Lake Leman. Three principal types of markings were described, the first of which was ascribed to the agency of *Tinodes*.—Prof. Westwood exhibited a series of drawings illustrating the economy and transformations of several species of trichopterous and other neuropterous insects, also drawings of some undescribed species of exotic heteropterous-hemiptera contained in the Hopeian collection; he likewise drew attention to a modification of the professorship which had been proposed by the Oxford Commissioners, whereby the science of entomology would probably be neglected, and which would to a certain extent render nugatory the intentions of the founder of the professorship and donor of the collections. Prof. Westwood also referred to the affinity of the genus *Polyctenes*.—Mr. J. Jenner Weir exhibited some ants, apparently a species of *Atta*, which he had found in large quantities at Pisa, and which were peculiar in having collected around their nests, large quantities of small empty shells of *Helix capuata* and *H. virgata*; Mr. Weir also exhibited a specimen of an *Orgyia*, stated on the authority of Mr. Gates to have emerged from the larval skin, without passing through the pupal state.—Mr. W. L. Distant communicated a note relative to some Indian hemiptera which he had received from India through Mr. F. Moore for examination, with the names of the plants on which they were found.—The Secretary read a note and exhibited a photograph which he had received from Dr. Fritz Müller.—The following papers were also communicated:—"List of the Hemiptera collected on the Amazons by Prof. Trail," Pt. 1, by Dr. F. Buchanan White.—"Descriptions of new Genera and Species of Tenebrionidæ from Madagascar," by Mr. F. Bates;—and "Descriptions of new Coleoptera from East Africa and Madagascar," by Mr. C. O. Waterhouse.—Mr. Butler communicated a paper on the natural affinities of the lepidoptera hitherto referred to the genus *Acronycta* of authors.—From an examination, chiefly of the larval characters, the author proposed to distribute the British species of the genus among the Arctiidæ, Liparidæ, Notodontidæ, and Noctuites.

Meteorological Society, November 19.—Mr. C. Greaves, F.G.S., president, in the chair.—The following gentlemen were elected Fellows:—Capt. C. K. Brooke, Rev. E. Carr, M.A., Capt. R. A. Edwin, R.N., W. B. Fawcett, C. J. Harland, J. Lucas, F.G.S., H. Mellish, G. B. Nichols, the Earl of Northesk, Dr. J. Robb, T. H. Walker, and C. L. Wragge, F.R.G.S.—The

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reports on the phenological observations for 1879 were read, the Botanical being by the Rev. T. A. Preston, M.A., F.M.S., the Entomological by the Rev. C. H. Griffith, B.D., F.M.S., and the Ornithological by J. Cordeaux. With the exception of a few days in the earlier parts of February and of March, the whole of the year 1879 has been characterised by a temperature almost invariably below the mean, accompanied with much wet and little or no sun; the effect on vegetation has been consequently very great. Foliage has, as a rule, been excessively luxuriant and dark, "forming the most remarkable feature of the year;" but rarely has fruit been able to ripen, and the second shoots have frequently been weak and unhealthy. Flowering has invariably been very late, as much as a month in some districts, the hay harvest often not completed till nearly the end of August, some still in "cock" in the Moorland district of Staffordshire, as late as September 30; and the corn harvest not only extremely late, but the corn in very poor condition, not properly ripened. With regard to insects the two most notable occurrences of this most dismal season have been the swarms of *Pyrameis cardui* and *Plusia gamma;* both these species have been wonderfully numerous, especially the latter, which has absolutely swarmed. The great severity of the past winter caused an almost unprecedented mortality amongst birds, great numbers of various species succumbing to the cold. This mortality was perhaps most apparent amongst the Turdidæ and the starlings. Spring brought little or no improvement, birds nested much beyond their average time, and in a vast number of instances the first eggs have been addled and destroyed by cold rains and an abnormally low and continuous temperature. The scarcity of young partridges is probably unprecedented, on some manors not a young bird is to be found, and it will take several good nesting seasons to bring up the stock of their old numbers.

A paper on the meteorology of Zanzibar, by Dr. John Robb, was also read. The average annual rainfall is rather more than 61 inches, or only about double the average yearly fall in England; and the average number of rainy days is 120. The greater rains fall in March, April, and May, the lesser rains are from mid-October to the end of the year. The driest month is September, with an average rainfall of 1·86 inch; no month is rainless. The mean temperature of five years is 80°·6, and the average yearly range, from highest maximum to lowest minimum, is 17°·3. The hottest months of the year are February and March, with a mean temperature of 83°·1 and 83°·4 respectively; the cool months are July and August, averaging 77°·5 and 77°·7. This gives a small amplitude of the yearly fluctuation, rather less than 6°, and to this limited range of temperature is largely due the debilitating nature of the climate of Zanzibar, particularly as affecting the nervous system. The heat is constant and moist, and even gentle exercise is usually attended with excessive perspiration.

PARIS

Academy of Sciences, November 24.—M. Daubrée in the chair.—The following papers were read:—On the heat of formation of ammonia, by M. Berthelot. He was led to doubt previous data. The action of chlorine on ammonia cannot rightly be used (as it has been) for the purpose, nor that of hypobromites, though preferable. M. Berthelot resorted to direct combustion of ammoniac gas by means of free oxygen. He arrives at + 21·0 and + 12·2 cal. for the heat of formation of dissolved and gaseous ammonia respectively. Between + 12·2 and + 26·7 (the number previously adopted) there is + 14·5 difference (the largest experimental error hitherto made in thermochemistry).—On crystallised chlorophyll, by M. Trécul. A claim of priority; he described crystals of chlorophyll in 1865.—Geodetic junction of Algeria with Spain; international operation executed under the direction of Gen. Ibanez and M. Perrier, by M. Perrier. Science has now a meridian arc of 27°, the largest that has been measured on the earth and projected astronomically on the sky. M. Perrier gives interesting details of the work, which included transport of steam-engines and Gramme machines, &c., to four mountain tops, Mulahacen and Tetica in Spain, Filhaoussen and M'Sabiha between Oran and the frontier of Morocco. Military guards were required, and the parties watched for signals from August 20 till September 9, without success. The observations, commenced on the latter date, terminated October 19.—Experimental researches on a new property of the nervous system, by M. Brown-Sequard. Certain parts of the nervous system, when under irritation, cause suddenly, or nearly so, a notable increase of the motor or sensitive properties of other parts of the system. Thus transverse section of a lateral half of the base of the brain increases the motor properties of the parts of this centre before the section, while the opposite is produced on the opposite side; the same with section of the sciatic nerve, or a lateral half of the dorsal or lumbar cord.—Researches on nitrification, by MM. Schlœsing and Muntz. They appear to have isolated the organism which effects the oxidation of nitrogen, *the nitric ferment.* The corpuscles are abundant, very small, and slightly elongated. The ferment is killed infallibly by a temperature of 100°, and 90° seems to stop its action. Deprivation of oxygen and desiccation are unfavourable to it. In media rich in organic matters, mucor is its chief enemy. It is not found normally in air; mould is its most favourable medium.—Observations on the egg-laying of winged phylloxeras in Languedoc, by M. Mayet.—On quadratic forms, by M. Poincaré.—Determination of curves and surfaces satisfying the conditions of double contact, by M. Zeuthen.—Specific heat of solutions of hydrochloric acid, by M. Hammerl. He tabulates his results, and modifies M. Marignac's formula so as to make it applicable to concentrated solutions.—On a new mode of separation of nickel, and of cobalt, by M. Dirvell. This consists in mixing with a solution containing cobalt and nickel, a (cold) saturated solution of salt of phosphorus, mixed with a solution of bicarbonate of ammonia, no longer giving any ammoniacal odour.—Constitution of dibromised ethylene, by M. Demole.—New method of analysing with precision the potashes of commerce, by MM. Corenwinder and Contamine. This method (very rapid and exact) relieves the operator of the necessity of first separating the sulphuric acid, phosphoric acid, and silica, which form with soda insoluble combinations in alcohol.—On the alterations of the epidermis, in affections of the skin, or of mucous membranes, which tend to the formation of vesicles, pustules, or pseudo-membranous productions, by M. Leloir.—Observations on the salivary glands of the Echidna, by M. Viallanes. The parotid glands, so constant in mammalia, have in this case escaped the attention of Cuvier and Owen, and the latter denies their existence in Echidna; but the author found them well developed. Instead of being in front of the auditory canal they are far behind it, at the level of the middle of the neck. On either side there are two sub-maxillary glands, one deep, the other superficial, and the latter seems also to have escaped attention.—M. Chasles presented, from Prince Boncompagni, a portion of "Researches on the Manuscripts of Pierre le Fermat followed by unpublished Fragments of Bachet, and of Malebranche."—M. Larrey presented a Portuguese work by M. Ennes, "The Medical Life of Nations."

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